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ABSTRACT

A document retrieval study conducted before and again after the building of a more centralized library at Syracuse University is used as an example of the kind of data gathering which can lead to improved decision making and evaluation of library services by library administrators. The study is discussed in detail to facilitate replication and to assist administrators in calculating the effect major changes or potential changes in library organization will have on the amount of time it takes to locate and retrieve materials. A specific application of the study would be to determine the extent to which a centralized library would be advantageous to a particular campus by measuring degrees of "cross over" and the impact changes in library organization would have on current library usage patterns, as well as the effects of changes in library organization on retrieval times, need for patron assistance, and management. Suggestions are offered for more effective data gathering and administrators are urged to use data to support their decisions. (Author/JPF)

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A STUDY OF DOCUMENT RETRIEVAL TIMES:

AN EXAMPLE OF HOW DATA & EVALUATION CAN LEAD TO IMPROVED DECISION MAKING IN ACADEMIC LIBRARIES.

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ABSTRACT

A document retrieval study conducted before and again after the building of a more centralized library at Syracuse University is used as an example of the kind of data gathering which can lead to improved decision making and evaluation of library services by library administrators. The document retrieval study is discussed in detail to facilitate replication. Suggestions are offered for more effective data gathering and administrators are urged to use data to support their decisions.

INTRODUCTION: Relationship Between Evaluation and Library Development

Increasingly, library administrators are realizing the crucial importance of library evaluation. They understand that it is important not only to justify their existence, but also to provide a solid basis for decision making. "Justifying their existence" has become an important concern for library administrators only since the fairly recent economic crunch. Prior to that, libraries were involved in an atmosphere of public acceptance, good will, and economic benevolence. Schmidt describes the situation well:

> Until recently, university libraries grew and increased several fold in size and cost of collection and of staff. Data available from fifty-one academic research libraries (i.e. members of the Association of Research Libraries) indicate that from 1951 to 1974 collections increased 158 percent, acquisitions expenditures increased 810 percent, expenditures for salaries and wages increased 880 percent, and total library expenditures during this twenty-four year period increased 770 percent for the fifty-one libraries.[1]

However, according to Schmidt, this period of seemingly unlimited growth has reached a limit. DeGannaro agrees that research libraries can no longer continue to provide 60s-level services and collections with present-day costs and budgets.[2] Kaser supports this point of view as well:

> As long as libraries did not cost much, society appears to have been content to fund them on the assumption that their contribution to the public good was obviously in excess of the meager investment required for their sustenance. With their exponential growth since World War II, however, libraries have become very expensive to operate, and society is no longer so sure that they are worth their high cost. Accordingly, libraries are increasingly being called upon to provide more rigorous justification for their budgets.[3]

The need to justify one's budget and the need for better decision making may be viewed as alternate sides of the same coin. Martin discusses the need of librarians for records and data which will provide a stronger negotiating

position when library budgets are being discussed.[4] Decisions and budget requests well-grounded in fact and theory will help to justify the affairs of the library to its funding sources. But the records and data needed for strong negotiating positions must be accumulated through on-going evaluation programs which conduct studies, incorporate the findings of the studies into the system, and then conduct new studies with more feedback. A continuous cyclical evaluative process is needed. Too often in the past this has not occurred. Evaluation has been viewed largely as a one-time event, and consequently its benefits have been limited.

It is also important that the results of library evaluations be made available outside of the institution under study. As the results of evaluation continue to be published or otherwise made available, future evaluators will be able to learn from both the strengths and weaknesses of completed studies. As studies are replicated, data will accumulate and add weight to theory. Gradually, more and more data can be used to support or reject library decisions, activities, and principles.

Evaluation is not done for its own sake. It has a practical aim, a goal.[5] It is measurement for a purpose, and the usual purposes of evaluation are more effective decision making, failure analysis, and performance analysis. This study examines data gathered by Pauline Atherton at Syracuse University before and after library consolidation. This analysis serves as an example of how measurement and evaluation can provide library managers and administrators with information for more effective decision making.

METHODOLOGY used in Atherton's Document Retrieval Studies

Although Syracuse University began making plans for a new library in the 1950s, the new Ernest Stevenson Bird Library was not built and opened until

1972.[6] Bird Library was designed to consolidate a number of separate collections of material at Syracuse University. Before Bird Library was built, a user had 19 choices of libraries to search; after Bird Library was built the number of libraries was reduced to 10, and this number has been further reduced since that time. Atherton was interested in looking at conditions before and after the building of a new library at Syracuse University. She was especially interested in examining how the move would affect those departments which would have the majority of their materials relocated--i.e. the humanities and social science departments. Ten percent of the faculty in the humanities and social science departments were surveyed and asked for titles of journals felt to be the most important in their fields. From these source journals which were in the Syracuse University libraries collections a representative sample of footnotes was randomly selected and used in two document retrieval studies. The final number of footnote references or items used in each study was 1067.

While this method a obtaining a representative sample of references has precedence (see Dougherty, 1973 and Dougherty and Blomquist,1974)[7] the resulting sample is probably biased toward the user who has faculty or graduate status. The references were drawn from journals recommended by faculty. Journals are used more by faculty and graduate students than by undergraduates. Therefore it is less likely that an undergraduate would wish to check a reference listed in a journal article. However, this potential for bias is mitigated by the fact that only the "most important" journals were used. So, while the bias may not be great, its potential should be kept in mind when considering to what population the results may be generalized.

A Retrieval Data Sheet (RDS) was developed and pretested. This form, see Table 1, was used by library science students who were paid by the hour, not by the sheet, to perform the retrieval process. Each RDS contained an item

STEP 1: STARTING POINT: STEPS OF HENDRICKS CHAPEL.

8 AM Time left H.C.
A.M. or P.M.

STEP 2: SEARCH FOR LOCATION.

8 CY Time entered library (1)
A.M. or P.M.

Item to be Retrieved:
Kenneth K. Sereno and Gary J. Hawkins, "The Effects of Variations in Speakers' Nonfluency upon Audience Ratings of Attitude toward the Speech Topic and Speakers' Credibility," Speech Monographs, XXXIV (1967), 58-64.
J 735 ED,VP

(2) Library at which search took place.	(3) Source (e.g., card catalog, serials list, computer search, etc.)	(4) Did you receive help from a library staff member? YES	(4) NO	(5) Was the Item Listed: IF YES: note location, call number, and time. location	call no.	time	(5) IF NO: proceed to another source after noting time.
A Bird.	Serial Content	X		Bird	LB15.54	8 08	
B*	* Three additional steps if necessary.						

STEP 3: ACTUAL RETRIEVAL FROM SHELF.

YES, FOUND 8 13 note time X. This is the end of your search! Success!

NOT, FOUND _____ note time _____. Proceed to Step 4.

STEP 4: OFF SHELF STATUS REPORT. Attempt to find reason for not being on shelf.

A. Was this item reported elsewhere in the library:

Check one reason.
(1) on reserve _____
(2) waiting to be shelved _____
(3) in process _____
(4) mis-shelved _____

IF NONE OF THE ABOVE:
Proceed to Step 4B

A. Note TIME status learned _____ A.M. or P.M.
B. Did you consult a library staff member for this information?
NO _____
YES _____ What source? _____
With aid of computer? YES ____ NO ____
C. Proceed to Step 5: final attempt to retrieve item.

B. Was this item reported out of the library:

Check one reason.
(1) in Carnegie or annex _____
(2) in storage _____
(3) in circulation _____
(4) at the binder _____
(5) reported missing _____
(6) other (specify): _____
_____
_____

A. Note TIME status learned _____ A.M. or P.M.
B. Did you consult a library staff member for this information?
NO _____
YES _____ What source? _____
With aid of computer? YES ____ NO ____
C. This is the end of your search.

STEP 5: FINAL ATTEMPT TO RETRIEVE ITEM.

If the item was reported to be on reserve, waiting to be shelved, or in process, make a final attempt to retrieve it. Try to track down its location.

Did you find it? YES _____ NO _____

Whether yes or no, this is the end of your search. CLOCK TIME NOW _____

DOCUMENT RETRIEVAL DATA SHEET (RDS)

TABLE 1

selected in the manner described above. It was the student's job to determine whether this item was in the Syracuse University libraries collections and to record the amount of time required to make that determination. This retrieval process was carried out for two studies at nearly the same time during the spring semesters of 1972 and 1973. Library school students were used to perform the retrieval process for both studies.

The use of Library school students to retrieve items raises the question of how typical they are. Is a Library school student an average user? Intuitively one suspects that a future librarian would perform the retrieval task as well as or better than the average user. The student might not, however, be as efficient as a professional librarian who had been working for a number of years. These distinctions should be kept in mind depending on what populations are compared to the results presented here.

The citations or items retrieved for the two studies were almost evenly divided between books and journals: 515 books and 552 journals. A RDS was completed for each of the 1067 items in each study. The clock times recorded on the RDS allow calculation of:

1) time required to walk to the first library chosen from a central location on campus

2) time required to determine the location of the item--this could involve going to five different libraries

3) time required to retrieve the item from the shelf--1st retrieval attempt

4) time required to determine the off-shelf status of items not on the shelf--checking to see if these items were in or out of the library

5) time required to retrieve those items whose off-shelf status report indicated they were in the library--final retrieval attempt

In addition to noting clock times, the person doing the search also recorded what sources were checked, the use or nonuse of staff help, and the success or lack of success of the retrieval attempt. The RDS also contained the full citation for each item and noted which department had recommended the source journal from which it was obtained. All of the above information was gathered

for 1057 items in a study before Bird Library was built, and for the same 1057 items in a study after Bird Library was built.

APPLICATION I: "Crossover" and library centralization

Any major change or potential change in library organization should involve careful evaluation. Warren N. Boes discusses the careful planning and describes the steps taken prior to the building of the more centralized Bird Library at Syracuse University.[8] Waldhart and Zweifel, and Shera summarize a wide range of arguments concerning centralization vs. decentralization of library facilities. Waldhart and Zweifel suggest that in determining whether a centralized library will be advantageous to a particular campus, "crossover" use should be considered. They explain crossover as "the degree to which those at one market or point of origin [e.g. academic department] use libraries at more than one location. . . . If crossover is negligible," they say, "a strong argument can be made for situating the libraries close to the primary market [e.g. the academic department]; if crossover is substantial, libraries should be placed so that they are most convenient to the total user population."[9] Shera agrees that "The cross-fertilization of disciplines. . . compels either library consolidation or extensive duplication [of materials]."[10] This suggests that the extent to which one's user population has "multi-disciplinary interests" should be an important factor in library organization decisions.

One way of looking at the extent of multidisciplinary interests in an academic community is to examine what literature is considered to be of value to faculty in several departments. We can assume that literature of interest to faculty will be recommended to students in those departments. Library use of these materials may be required or at least encouraged.

	FREQUENCIES Absolute (Relative:%) 1st Study		2nd Study	
A:Attempt to determine location of item:				
1--First library chosen:				
main library	951	(89.1)	987	(92.5)
all other libraries	116	(10.9)	80	(7.5)
	1067	(100.0)	1067	(100.0)
2--Second library chosen:				
main library	59	(63.4)	44	(61.1)
all other libraries	34	(36.6)	28	(38.9)
	93		72	
3--Library where item located:				
main library	926	(86.8)	974	(91.3)
all other libraries	141	(13.2)	93	(8.7)
	1067		1067	
B:Attempts to retrieve item from shelf:				
1--1st attempt:found	726	(68.0)	825	(77.3)
not found	341	(32.0)	242	(22.7)
	1067		1067	
2--Off-shelf status of items not on shelf:				
IN library	64	(18.8)	63	(26.4)
NOT IN library	277	(81.2)	176	(73.6)
	341		239	
3--Final attempt:				
found	51	(80.9)	48	(85.7)
not found	12	(19.1)	8	(14.3)
	63		56	
C:Use of staff help:				
1--1st attempt to locate:yes	70	(6.6)	76	(7.1)
no	941	(88.2)	918	(86.0)
no response	56	(5.2)	73	(6.8)
	1067		1067	
2--final attempt to locate:yes	22	(23.7)	34	(47.2)
no	57	(61.3)	35	(48.6)
no response	14	(15.0)	3	(4.2)
	93		72	
3--to determine off-shelf status:				
a: if IN library:yes	55	(85.9)	34	(54.0)
no	0	(0.0)	26	(41.3)
no response	9	(14.1)	3	(4.7)
	64		63	
b:if NOT IN library:yes	204	(73.6)	147	(83.5)
no	39	(14.1)	21	(11.9)
no response	34	(12.3)	8	(4.6)
	277		176	
D:No. of steps required to locate item:				
1 step	976	(91.5)	995	(93.3)
2 steps	77	(7.2)	57	(5.3)
3 steps	11	(1.0)	14	(1.3)
4 steps	1	(0.1)	1	(0.1)
5 steps	2	(0.2)	0	(0.0)
	1067		1067	

TABLE 2

To gather bibliographic references which would be "representative of the typical items which might be sought by the library user" Atherton surveyed 10% of the faculty in humanities and social sciences (27 departments and schools), asking them to indicate titles of journals which they felt were "the most important in their field."[11] Of the 69 journal titles gathered this way, 13 were mentioned as "most important" sources by faculty in more than one department or school. This suggests a minimum "crossover" use at the Syracuse University libraries of 18.84%.

Additional insight into "crossover" is available if we look at the results of the retrieval portions of Atherton's studies. The move to Bird Library in 1972 reduced the number of different libraries at Syracuse University from 27 departmental libraries at 19 different grographic locations to nine (9). This number has since been reduced further as several of these nine departmental libraries have been combined in the remodeled and reorganized Carnegie Library.

Analysis shows that before the move 86.8% of the items located and retrieved were in the main library. After the move, 91.3% of the items were there. (See A-3, Table 2.) These figures suggest that Syracuse University was moving from a somewhat centralized library to a more centralized one rather than from a decentralized to a centralized library. They also suggest a means for other libraries to examine their own need for more or less centralized collections. By examining the present location of library holdings, by considering the amount of crossover useage with a method such as that described above, and by determining the extent to which these patterns would be altered by relocation of materials, an administrator should be able to present an effective argument--supported by data--in favor of a particular manner of library organization.

APPLICATION II: Retrieval times, use of assistance, and effective management

Harold M. Schoolman writes: "The user does not need better library methods; he needs a more direct route to the information he seeks."[12] This assertion holds true for the professional librarian as well as for the user. When an administrator is concerned with budget justification, he is very aware of the link between time and money. No matter who is looking for a book or a journal, librarian or user, the search takes time.

Starting with the user at the door of the library, analysis of Atherton's data shows that in both Study 1 and Study 2, successful location and retrieval of an item found on the first attempt took an average of about 10 minutes.[a] Half of the items were located and retrieved in about 8 minutes. Remember that location means determining where an item should physically exist within the library system and retrieval means going to that location to see if the item is actually there. (See Part A-3, Table 3). If an item was not on the shelf, its off-shelf status was checked. This required 3-6 minutes and varied depending on whether the item was in or not in the library. (See Part A 4, Table 3). If an item was not on the shelf for the 1st retrieval attempt but was in the library, the median time required for retrieval increased to nearly 20 minutes in the 1st study but only to about 18 minutes in the 2nd study. (See Part C-2, Table 3). This is nearly a 10% savings of time between the two studies.

There is an additional savings of time which should not be overlooked. The rate of successful retrieval on the first attempt was 68.0% in the 1st

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[a]While both means (averages or the sum of the scores divided by the number of scores) and medians (the middle score or that score which has 50% of the scores on either side of it) are reported in Table 3, the more conservative median is reported in the text. Skewed data (one or two extreme scores) made use of the median seem preferable.[13]

TASK--(minutes)	1st Study MEDIAN	MEAN	St. DEV.	Min-Max	No. of ITEMS	2nd Study MEDIAN	MEAN	St. Dev.	Min-Max	No. of ITEMS
A--(After entering 1st library) Attempt to:										
1:Determine location of item:	3.1	4.6	5.1	1-57	1067	3.2	3.9	3.0	1-28	1067
2:Retrieve item after 1st attempt to locate it:	4.2	5.7	5.5	1-47	1067	5.1	6.6	6.3	1-82	1067
3:FIRST ATTEMPT AT RETRIEVAL FROM SHELF:	7.6	10.3	8.2	2-87	1067	8.4	10.4	7.5	2-105	1067
4:Determine status of item not on shelf:										
a:Item IN library:	4.2	5.7	6.6	1-50	64	4.8	6.0	4.8	1-26	1067
b:Item NOT IN lib:	3.0	5.2	5.9	1-55	277	6.6	8.0	8.6	1-81	176
5:Retrieval after status determined--if in library:	2.3	4.2	4.5	1-24	63	2.3	3.4	3.2	1-18	56
B--Determine location of item:										
1:2nd attempt:	3.6	5.8	5.7	1-37	93	7.7	10.8	11.3	1-58	72
2:3rd attempt:	2.5	6.4	6.5	1-19	14	6.8	8.8	8.0	1-25	15
C--To retrieve item--time between:										
1:1st and final attempt:	7.6	10.0	8.2	3-55	63	7.4	8.9	5.9	3-35	56
2:Entering 1st library and final attempt:	19.6	22.6	16.3	6-120	63	17.8	18.9	8.8	7-60	56
D--AVERAGE TOTAL TIME (weighted) TO COMPLETE SEARCH:	6.1	8.6				7.7	9.6			

TABLE 3

study. (See Part B-1, Table 2). This rate increased to 77.3% in the 2nd study. If we assume that all those items in the 1st study which were not retrieved on the 1st attempt were retrieved on a second attempt, that difference results in a minimum time savings between the two studies. If any items had taken a third or fourth attempt to retrieve, the savings would be even greater. This minimum savings can be determined as follows:

for 1000 items--successful 1st attempt retrieval--

2nd Study : 77.3%
1st Study : 68.0%

At 8 minutes per item, the retrieval of 773 items in the 2nd Study required 103.1 hours, and the retrieval of 680 items in the 1st Study took 90.7 hours. The additional 93 items in the 1st Study required 20 minutes each or another 31 hours. The difference between 90.7 plus 31 or 121.7 and 103.1 hours is 18.6 hours or a minimum time savings of 18.1% in the 2nd Study.

An 18% saving of time is important from a managerial point of view. As the number of items retrieved increases, the difference in time spent becomes quite large. Since this difference in time results primarily from the fourth and fifth steps of the retrieval process (determining off-shelf status of items and final retrieval attempts). it would be to a manager's advantage to see if these times can be further reduced.

By making use of a study such as the one described above, an administrator can gather data and study the retrieval process in his or her own library. Times for different steps in the retrieval process can be studied and then possible changes that might reduce those times could be considered. Changing the location of the shelf list or the serials list, for example, could make retrieval of materials more efficient. Making an off-shelf status report avaliable to users and encouraging them to use it could also save time. Duplicate copies of these various lists might be justified, especially in a

Library like Bird Library where elevators must be used (and waited for) to reach the upper floors of the library. However, time-savings changes should be easy to implement even in libraries which are less flexible than Bird Library was designed to be.[14]

CONCLUSION: Evaluation and the future

Time is only one of many barriers to library use. It is, however, a barrier which library administrators and managers are in a position to lower. This study has shown how evaluation can help the administrator to lower this barrier by pinpointing where time can be saved in the document retrieval process. Kaser calims that library administrators and managers are now in a position of being able to apply "more meaningful evaluation techniques than were possible in earlier times. Better evaluation techniques will mean better decisions, and better decisions will improve the library economy for the commonweal."[15] However, as Evans, et. al. note:

> difficulties arise from the lack of available techniques for measuring and evaluating the quality of a service or function. One fundamental problem is that none of the current evaluation methods seems to consider total library performance as critical to making a valid evaluation. Also, most of the present evaluation techniques do not seem sufficiently sensitive to both quantitative and qualitative factors of library service and are therefore not completely acceptable to either librarians or nonlibrarians.[16]

This situation has begun to change. Researchers are attempting to develop multiple measures which accurately reflect library activities and concerns. As library administrators and their staffs become increasingly convinced of the value of data and genuinely committed to evaluation, evaluation will become an integral part of the library system. What is learned during the evaluation process will be incorporated into the system, a new evaluation

will be designed, and these results will also be incorporated in a continuous cyclical process. As this occurs, Martin's comment that "evaluation has been a marginal activity in libraries, engaged in sporadically, often carried out half-heartedly, its results applied reluctantly"[17] will no longer be true. The future, ideally, will be filled with library administrators who understand the usefullness of evaluation and who have incorporated it into their library systems as an important and integral part.

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